METHOD OF TEST
DETERMINING THE AMOUNT OF CLAY LUMPS AND FRIABLE PARTICLES IN COARSE AGGREGATE (METHODS A AND B)

SCOPE

This method of test covers the procedure for the determination of clay lumps and friable particles in coarse aggregates. Clay lumps and friable particles are objectionable materials in the aggregate due to contamination at the time the deposit was formed, at the time of quarrying, or at the time of hauling and handling. Clay lumps and friable particles are considered any agglomerated or soft particles retained on the #4 sieve and greater, and will include such terms as mud and clay balls. Method A is used to evaluate either stream flow or stock piles samples. Method B is used to evaluate only stream flow samples. The Engineer shall determine the method most appropriate for individual sources. If a sample does not meet specification limits for either test method, the sample is considered noncomplying.

PROCEDURE

A. Apparatus

1. Balance - A balance having a capacity of at least 5000 grams, accurate to 0.5 gram.

2. Oven capable of maintaining temperature @ 110 ± 5°C (230 ± 9°F) or hot plate used at a reduced temperature, and capable of providing a uniform heat until sample has dried to a constant weight.

3. Containers - Containers of a size and shape that will permit the spreading of the sample on the bottom in a thin layer.

4. Sieves - Sieves conforming to AASHTO M92, wire cloth sieves for testing purposes.

B. Sample

1. Select a representative sample of material retained on the 4.75 mm (No. 4) sieve that will weigh at least 3000 grams.

METHOD A

C. Test Procedure

1. Separate clay lumps and friable particles from the test sample by hand picking. The sample may be wetted and decanted if this aids identification. Oven dry the clay lumps and friable particles to a constant weight.

2. Allow the clay lumps and friable particles to cool and determine the dry weight (L).

3. Dry the test sample to a constant weight.

4. Allow to cool and determine the dry weight (W).

D. Calculation
Percent of clay lumps and friable particles (P) = 100 X L/(L+W)

Where:
P= percent of clay lumps and friable particles
L= dry weight of clay lumps and friable particles
W= dry weight of test sample

METHOD B (Field Procedure for Laboratory Test Method 214)

C. Test Procedure

1. Wash over No. 4 (75μm) sieve.

2. Oven-dry for at least 16 hours at a temperature of 230° ±9°F (110°±5° C)

3. Allow sample to cool and determine the dry weight (W).

4. Spread sample in a thin layer on the bottom of the container, cover it with water and allow it to soak for a period of 24±4 hours.

5. After soaking period any particles that can be broken with fingers into fines removable by wet sieving over the No. 8 (2.36 mm) sieve shall be classified as clay lumps or friable particles.

Note – The breaking of clay lumps and/or friable particles shall be accomplished by squeezing and rolling them between the thumb and forefinger. The fingernails or mechanical tools shall not be used to break up the particles nor shall they be pressed against a hard surface.

6. Wet sieving is to be accomplished by passing water over the sample through the sieve while manually agitating the sieve, until all undersize has been removed.

7. The retained particles shall The be carefully removed from the sieve and dried at a temperature of 230°±9°F(110°±5°C).

8. Allow sample to cool, and weigh (R).

D. Calculation

Calculate the percent of clay lumps and friable particles of coarse aggregates as follows:

$$P = \left(\frac{W - R}{W} \right) \times 100$$

Where:

P = Percent of clay lumps and friable particles.
W = Dry weight of test sample after washing on the #4 sieve.
R = Dry weight of particles retained on the No. 8 (2.36mm) (wt. of test sample after removal of clay lumps).